

## DISPOSITION OF PUBLIC COMMENTS

### AC NO. 25.803-1A, EMERGENCY EVACUATION DEMONSTRATIONS

Comment	Requested Change	Disposition
<p>Commenter: <b>Zhang Zhuguo SAACC</b></p> <p>Page 8-section (6) states that the number of crewmembers required by the operating rule refers to the minimum number of flight crewmembers listed in AFM and the minimum number of flight attendants. While, usually, the airplane with a fixed passenger capacity may be operated with more flight attendants than the minimum number required by operating rule. So I consider the number of crewmembers should be the maximum to match the crewmember's seat capacity, because the more seating capacity, the more critical. I also consider the observer seats need be occupied for the demonstration with the same reason mentioned above.</p>		<p>While it can be argued that more occupants will increase the evacuation time, this is not the case when those occupants are crewmembers. Additional crewmembers contribute to the overall efficiency of the evacuation and therefore would reduce the evacuation time. With respect to observer seats, the 90 second timeframe was established based on passengers and required crew, so adding observer seat occupants is not consistent with the assumptions on which the requirement is based. There is no change to the AC.</p>
<p>Commenter: <b>Zhang Zhuguo SAACC</b></p> <p>Page 9-section c:</p> <p>Paragraph of appendix J states that all emergency equipment required for the planned operation of the aeroplane must be installed. The flashlight as emergency equipment should not be installed because of additional illumination provided which will be contrary to section (a) of appendix J.</p>	<p>The emergency assist means <b>except flashlight</b> used in the demonstration should be of the type intended to be part of the airplane type design.</p>	<p>Although installed, the flashlight is not used in the demonstration as specified in paragraph d of appendix J , and therefore would not contribute illumination. There is no change to the AC.</p>
<p>Commenter: <b>Zhang Zhuguo SAACC</b></p> <p>Page 10-section d (4):</p> <p>I consider add following: before start, the normal cabin lighting should be turned to dimming condition for a reasonable time</p>	<p>Add a provision to allow some dark adaptation prior the start of the demonstration.</p>	<p>Since part of the demonstration is the effectiveness of the emergency lighting system, the transition from normal to emergency lighting is an important element. The FAA will not recommend</p>

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for passenger to adjust them to the dark night for minimizing the injury.		this practice. There is no change to the AC.
<p>Commenter: <b>Zhang Zhuguo SAACC</b></p> <p>Page 11 section g: In order to minimize the injury, the sentence in the right column should be added.</p>	No person older than 60 or younger than 18 should participate in the demonstration.	<p>The current guidance does not include persons in these age groups, but neither are they prohibited. The AC includes a discussion of 'informed consent,' but beyond that it is the applicant's responsibility to provide for the safety of participants.</p>
<p>Commenter: <b>Zhang Zhuguo SAACC</b></p> <p>Page 12-section k: Should the baggage, blankets, pillows and other similar articles be distributed before demonstration beginning or before passengers boarding on airplane? I request clarify this issue.</p>		<p>Debris should be distributed after the passengers receive the safety briefing on board the airplane. We revised the AC to include this provision.</p>
<p>Commenter: <b>Zhang Zhuguo SAACC</b></p> <p>Page 12- section l (4): For the means of deactivating exit, I consider the red indications on the door windows are acceptable. I request clarify whether the window shades should be pull-down or not. Pulling down the shades is to avoid giving any crewmember or passenger indication which exits to be used, however, this may be contrary to section (f) of appendix J which states that each internal door or curtain must be in the takeoff configuration.</p>		<p>The use of indications that are visible after the exit has been opened can work, but are susceptible to persons using the exit, and thereby complicating, if not invalidating the demonstration. Therefore, the AC recommends mechanical deactivation. An applicant can propose another method, but the FAA does not in general recommend it. No change to the AC.</p> <p>With respect to the window shades, the windows should be obscured from the outside, so the position of the shades will not matter. We added this recommendation to the AC.</p>

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<p>If pulling-up the [shades], other means should be used to meet the goal, i.e., covering all the windows including flight deck windows with curtain from outside. Then there is no sense of pulling-up or down window [shade].</p>		<p>Paragraph (f) of appendix J contains requirements only for internal doors and curtains, and has no requirements for window shades. "Curtain" refers to a fabric partition between interior compartments, rather than to the window shades.</p>
<p>Commenter: <b>Zhang Zhuo SAACC</b>  Page 14-section o: Flightcrew exit as a pair exit should be used for flightcrew only consistent with their approved training program, because some training program may permits the co-captain evacuating from the right side exit in order to help passenger evacuation.</p> <p>If flightcrew would evacuate the flightdeck through flightdeck door, should the door simulate the jamming condition according to the requirement of 25.772.</p> <p>Exit used in the demonstration must consist of one exit from each exit pair; I consider the combination of exits likely to result in the slowest evacuation times or critical side exit should be required. And I request clarify whether the combination of exits should be on the same side of airplane or not.</p>		<p>The intent of the demonstration is to evaluate the maximum passenger capacity, along with the required crew complement, using the passenger exits. Although it is true that the flightcrew may use the dedicated flightcrew exits in an actual emergency, for the purposes of the demonstration, only the passenger exits are used.</p> <p>The flightdeck door requirements with respect to jamming are assessed separately from the full-scale evacuation demonstration, so the flightdeck door does not need to be jammed. The evacuation demonstration is a standardized procedure and is not intended to address all features of the airplane evacuation capability in their most critical condition.</p> <p>With respect to selecting the exits to be used, they are generally considered the combination, using one from each pair,</p>

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<p>Commenter: <b>Zhang Zhuoguo SAACC</b></p> <p>Section (r) of appendix J states that the flightcrew must take no active role in assisting others inside the cabin during the demonstration. What about if passenger asking for help inside the cabin?</p>		<p>that would produce the longest evacuation time. However, there are factors in addition to exit size that could influence this decision, including the interior egress paths, cabin visibility and distribution of crew. It is acceptable that all exits are on the same side, but not required.</p> <p>In the case where one of the volunteer passengers is in need of real assistance, it would be unrealistic to expect the flightcrew to ignore them. The intent of this paragraph, however, is that the flightcrew are essentially extra 'passengers' in that they simply exit the airplane and do not take an active role in managing the evacuation.</p>
<p>Commenter: <b>Zhang Zhuoguo SAACC</b></p> <p>Page 14-section p:</p> <p>I request clarify in which injury situation the director should stop the demonstration, and if all the participants evacuate from the airplane within 90s, in which percent of injury person number the demonstration is considered unacceptable.</p>		<p>The test Director has the discretion as to whether or when to abort the demonstration. There is no prescribed set of conditions that exist that define when to abort the demonstration.</p> <p>In fact, the requirements of § 25.803(c) can be met irrespective of injuries that occur. However, a significant number of injuries more than likely means that some aspect of the evacuation system is deficient, which, while not directly affecting compliance with § 25.803(c), might require design changes that indirectly affect compliance with § 25.803(c).</p>
<p>Commenter: <b>Zhang Zhuoguo SAACC</b></p>		<p>In this case, it is possible that the operator</p>

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If exit opening and slide pre-deployment, the compliance with 121.291 is not shown because the opening exit and deploying slide have not been demonstrated by regularly schedule line crew, should additional demonstration be required for compliance with 121.291?		would have to perform a partial demonstration has described in § 121.291(c).
<b>Commenter: Cessna Aircraft:</b> No comments	N/A	N/A
<b>Commenter: European Aviation Safety Agency</b> 9.b Technical Basis for the Analytical Approach	Proposed change: It is proposed adding a sentence stating that data shall be derived at least from one successful full scale evacuation demonstration conducted in compliance with appendix J of FAR Part 25.  Reason: The current AC text leaves it open to use data from unsuccessful tests as well as tests conducted not following the requirements of appendix J.	The intent of this paragraph is to state that <i>all</i> relevant data be included in the analysis. The reference to unsuccessful full-scale demonstrations is simply to recognize that, while those may have some valid information, they cannot be used without first understanding the nature of the test failure and how that could influence the validity of the data. Nonetheless, it is possible, such as in the case of the MD-11 airplane, that there are no directly applicable full-scale data from a successful demonstration, but that there are sufficient data to support an analysis. Thus, while the FAA agrees that the primary source of data should be successful full-scale demonstrations, this may not always be the case. We added a sentence to the AC to emphasize the intent



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<p><b>Commenter: European Aviation Safety Agency</b></p> <p>9.u Success Criteria</p>	<p>Proposed change: It is proposed adding a sentence stating that the formula</p> $\text{Time margin} = \sum_{j=1}^n (90 - T_{\text{Total Exit } j})$ <p>in paragraph 9.u.2.a may only be used for seat layouts in those aircraft where the distribution of passengers over emergency exits can be practically managed by cabin crew (i.e., exclude single aisle aircraft).</p> <p>Reason: The use of the formula would allow evacuation analysis to be successful where for example 3 out of 4 exits can be evacuated within 89.9 seconds each and 1 exit is evacuated within 81 seconds. Using the formula it results in a value greater than 9 seconds. This pretends that there is a margin for that configuration which is not true for the majority of the exits in the cabin. Single aisle aircraft tend to have Type C, I, or III exits with only one cabin attendant per exit pair. There is no crew available to manage the evacuee flow in the cabin or between exits, as well as there is no space to pass by an exit. The calculated margin at one exit can therefore not be credited for the whole cabin. A more realistic safety margin establishment would be that method defined under 9.u.2.b.</p>	<p>of the comment.</p> <p>The time margin calculation in paragraph 9.u. is only one criterion for an acceptable analysis. The intent of the criteria is to have a way to quantify the time margin that also recognizes the benefits of multiple pairs of exits. While it is true that the literal application of the criteria does allow for unequal evacuation times, this seldom, if ever occurs to this degree, because adjacent exits are almost always more closely matched. The FAA agrees that the passenger management needed to achieve the distribution of passengers shown is prerequisite for an acceptable analysis. We added a statement to this effect to clarify this point. The occurrence of bypass with single aisle airplanes is not unusual, although is generally not the intended passenger management.</p>

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	Therefore we recommend to allow calculations under 9.u.2.a only for layouts including 2 main aisles and Type A emergency exits having cabin crew member to manage the evacuee flow.	
<p><b>Commenter: Boeing Commercial Airplanes</b></p> <p>Clarify that the guidance regarding flight attendant duties is applicable if compliance with §121.291 is also being sought. This will remove ambiguity, since compliance with paragraph g. of Appendix J is not optional.</p>	<p>“c. If compliance with §121.291 is sought per paragraph g. of appendix J to part 25, <del>the</del> then any change that affects the duties of the flight attendant(s) must be evaluated. ...”</p>	<p>Agree. The AC is changed accordingly.</p>
<p><b>Commenter: Boeing Commercial Airplanes</b></p> <p>p.9 Paragraph 8.c. Paragraph e. of part 25, Appendix J, addresses all emergency equipment required for the planned operation of the airplane. However, the guidance in paragraph 8.c. of the proposed AC only addresses the emergency assist means. We request that additional guidance be provided to allow the option to forego the installation of emergency equipment that has no bearing on the outcome of an evacuation demonstration. This will help make it easier to re-configure an interior arrangement in</p>	<p><i>Add c. ... Installation of any other emergency equipment (e.g., fire extinguishers, portable oxygen bottles, smokehoods, first aid kits, etc.) that has no influence on the outcome of the demonstration (located in bins, closets, etc) is not required.”</i></p>	<p>Paragraph 8.c. of the AC is only intending to speak to the escape slides/assist means. However, since the regulatory language speaks to ‘intended operation,’ there is some flexibility as to just what this would constitute for an airplane used in the demonstration. The regulation is clear that all emergency equipment is required and the AC cannot override the rule. It would be acceptable to represent by mockup certain equipment that has no effect on egress, or is not necessary for the demonstration. No change is made to the AC.</p>

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<p>support of an evacuation demonstration. The installation of emergency equipment in remote locations has no influence on the evacuation demonstration itself. The actual airplane equipment is not needed when trained support personnel are provided to handle foreseeable emergency events that may occur during the evacuation test.</p>		
<p><b>Commenter: Boeing Commercial Airplanes</b>  Page 10 Paragraph 8.d.(2)  Paragraph r. of Appendix J prohibits the flightcrew from taking an active role in assisting others inside the cabin during the demonstration. Therefore, the evacuation demonstration cannot be used to validate the effectiveness of a flightcrew emergency training program or evacuation procedures. During more recent evacuation demonstrations, the FAA has found it to be acceptable to use test support personnel to perform the flight deck duties, since they were prohibited from performing any passenger management duties.</p>	<p>"(2) Evacuation demonstrations intended to meet the requirements of § 25.803(c) and §121.291(a)(1) should use regularly scheduled line <del>flight</del> attendants. These demonstrations are conducted to demonstrate both the evacuation capability of the airplane and the effectiveness of the <del>flight attendants'</del> flight attendants' emergency training program and evacuation procedures</p>	<p>Agree. The AC is revised accordingly.</p>
<p><b>Commenter: Boeing Commercial Airplanes</b>  <b>Page 24 Paragraph 9.s., Note 1</b>  Provided the same numbers of aisles are provided, it should be permissible to use</p>	<p><b>NOTE 1:</b> Bypass of an active exit, when included in the analysis, must be based on <del>bypass accomplished at an identical exit type observed during a full-scale demonstration conducted on a similar airplane with the</del></p>	<p>The FAA does not agree that crew training and procedures would always override the particular exit type regarding the ability to execute bypass. Exit bypass for a single aisle, single lane exit would be different</p>



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<p>bypass data from other exit types. Bypass is much more a function of the evacuation procedures used by the flight attendants than it is a function of the size of the exit. Bypass is an effective evacuee management procedure used by the flight attendants to balance the flow of evacuees to all usable exits. Provided that similar flight attendant evacuation procedures are used, the use of bypass should be consistent with that observed during a full-scale evacuation demonstration conducted on a similar airplane model with the same number of aisles, regardless of the type of the exit being bypassed.</p>	<p><i>same number of aisles.</i></p>	<p>than for a dual lane exit, or an exit that was significantly larger or smaller, whether the crew procedures were similar or not. The ability of the crew to actually execute that type of passenger management must have been demonstrated previously using the same exit type in order to have sufficient confidence that it is viable, and suitable in an analysis. There is no change to the AC.</p>
<p><b>Commenter: Professor Timothy Law Snyder</b>  This proposal, which is nearly identical to the AC 25.803-1A initiated on August 31, 1998, uses techniques developed earlier in the 1980s. The proposal does not respond to comments submitted in the past, and it does not respond to available data that might help assess its viability.</p>	<p>Revise AC to address previous comments on interactions.</p>	<p>Professor Snyder's well thought out comments are appreciated. The FAA has no real disagreement with the concepts put forward or that there are complex interactions that occur in a dynamic event such as an emergency evacuation. However, the issues raised are predominantly those that would arise during an actual emergency, rather than a demonstration. In the case of a demonstration, where the participants know there is no danger, many of the concerns presented would not apply. Furthermore, the way in which these</p>

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<p><b>Commenter: Professor Timothy Law Snyder</b></p> <p>The proposed component testing/analysis-based certification described in Draft AC 25.803-1A is now roughly 30 years old. For us to have information concerning its effectiveness, sound science requires that analyses carried out using AC 25.803-1A's proposed methodology prior to full-scale evacuations be used to verify the methodology's track record. If this data exists, it should be included as part of the</p>	<p>Include data on predictive use of analytical methods described in this AC.</p>	<p>potential interactions manifest themselves will likely not be replicated on repeated trials, so the results of a single demonstration are not necessarily reflective of the complete set of possible results.</p> <p>The intent of § 25.803 is to provide repeatable, comparable evacuation results for certification purposes, demonstrating that an airplane can be evacuated in a timely manner. This rule is not intended to ensure an airplane can be evacuated within 90 seconds under all foreseeable conditions.</p> <p>With respect to the data available, the FAA has used its access to these data to assess the methodologies provided. However, the data are largely proprietary, and are not publicly available for inclusion in the AC.</p> <p>The FAA has carried out this exercise on its own, from various full scale demonstrations in the past. However, the data involved are proprietary, and cannot be included in the AC, which is public. The demonstration (or analysis in lieu of demonstration) is simply a determination of whether the airplane has the capability of being evacuated within 90 seconds, under prescribed conditions. It is not intended to capture all possible scenarios, both with respect to the physical nature of</p>

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<p>Draft AC, notably, it is not included, even though the Draft AC notes, in AC 25.803-1A's Section 9.i., that "Conditions called out in appendix J to part 25 and § 121.291 are the best qualifiers for screening existing evacuation performance data to be applied to the subject configuration." The data and outcomes from each of the evacuations performed over the last several decades, cited by AC 25.803-1A as "best qualifiers" for component test verification, should also be used to assess validity of the entire procedure being proposed.</p>		<p>an emergency, or the multitude of occupants' response to that emergency. In fact, airplane models have, at various times, been required to be demonstrated for evacuation after an analysis has been prepared. The analysis has most often proven to be conservative.</p>
<p><b>Commenter: Professor Timothy Law Snyder</b></p> <p>I urge you to read the 1999 White Paper, which I have attached, relative to the revised Draft AC 25.803-1A. The challenges described in the White Paper remain unaddressed by the Draft AC, and the chances of serious tragedy resulting from the Draft AC's proposed untested and inadequate procedures remain with us.</p>	<p>Not specific; use previous comments to modify the AC.</p>	<p>The FAA has again read the 1999 paper written by Professor Snyder. This paper is a comprehensive assessment of the complexity of multiple interactions and the potential for permutations of those interactions during an event such as an emergency evacuation. However, as noted above, the evacuation demonstration for the purpose of showing compliance to 25.803 is performed with no threat to occupants, and under prescribed conditions, which eliminates many of the potential variables of significance described in the paper.</p> <p>The FAA does not agree that the AC procedures are untested or inadequate. The AC procedures have been used and</p>

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		evaluated many times. They fulfill the purpose and intent of the rule.